PATENT APPLICATION

OF

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FOR

ACCESS FITTING FOR

GAS SAMPLING BAG

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates generally to gas sampling bags, and is concerned in particular with a new and improved fitting for sealing and gaining access to an opening in the bag wall.

2. Description of the Prior Art

The lowest cost and most commonly used gas sampling bags are fabricated from Tedlar with polypropylene access fittings. However, the reusability of such bags is limited due to gas adsorption on the surface of the Tedlar material, which could adversely affect sensitive testing of subsequent gas samples.

All perfluoroplastic gas sampling bags, i.e., those fabricated from perfluoroalkoxy (PFA), fluorinated ethlylene propylene (FEP) or polytetrafluorethylene (PTFE) are also available, but at a much higher cost, due primarily to their complicated and expensive access valves that are typically machined from perfluoroplastics or stainless steel. These materials resist surface adsorption of the gases being sampled, thus making is possible to use the sampling bags repetitively. However, this advantage is compromised by the limited septum life of the access fittings.

SUMMARY OF THE INVENTION

One objective of the present invention is to provide a simpler less costly perfluoroplastic access fitting that can be used in conjunction with perfluoroplastic bag material to provide a sampling bag priced competitively with the lower cost Tedlar bags currently in use.

Another objective of the present invention is to provide an access fitting with a shiftable septum that can be repetitively punctured at different locations, thus beneficially extending the useful life of the access fitting and its associated sampling bag.

Still another objective of the present invention is the provision of an access fitting having its most expensive component detachable for reuse with other fittings.

These and other objectives, features and advantages will now be described in greater detail with reference to the accompanying drawings wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1 is a perspective view of a gas sampling bag equipped with an access fitting in accordance with the present invention;

Figure 2 is a sectional view on an enlarged scale taken through the access fitting shown in Figure 1 with the septum slidably adjusted to its open position to accommodate filling of the bag with a gas sample;

Figure 3 is a sectional view through the access fitting at a 90° angle with respect to Figure 2; and

Figure 4 is a sectional view similar to Figure 2 showing the septum shifted to its closed position and punctured by a needle during removal of a gas sample previously charged into the bag.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

With reference initially to Figure 1, a gas sampling bag is shown at 10 equipped with an access fitting 12 in accordance with the present invention.

The bag is comprised of two walls 14a and 14b of flexible material sealed as at 16 along their peripheral edges. The bag material can be selected from any of the materials currently available, preferably perfluoroplastic material such as PFA, FEP or PTFE, and most preferably a multilayer PTFE composite available from Textiles Coated International of Amherst, New Hampshire under the trade name "LFP".

With reference additionally to Figures 2-4, it will be seen that the upper wall 14a has an opening 18. The access fitting includes a housing having a base 20 and a cap 22 located respectively on interior and exterior sides of the bag wall 14a. The base and cap are provided respectively with inner and outer ports 24, 26 aligned with the opening 18 to provide a thorough passageway communicating with the bag interior.

Preferably, an interior sealing gasket 28 is interposed between the base 20 and the interior of the side wall 14a, and an exterior sealing gasket 30 is interposed between the exterior of the side wall and the cap 22.

The underside of the cap 22 is provided with a channel groove 32 configured and dimensioned to receive an elongated septum 34. The septum has a through hole 36 and is slidably adjustable between an open position as shown in Figures 2 and 3 at which the hole 36 is aligned with the through passageway defined by ports 24 and 26 and the opening 18, and a closed position as shown in Figure 4, at which the hole 36 is removed from the through passageway, the latter being blocked by an imperforate segment of the septum.

A tubular connector 38 is threaded into the outer port 26. The connector has a through bore 40, an enlarged diameter mid section 42, and a reduced diameter upper end dimensioned detachable for connection to a supply tube 44 (see Figure 2). The connector 42 is rotatably and axially adjustable between an advanced position as shown in Figure 4 at which it bears against the septum to frictionally resist its slidable movement, and a retracted position as shown in

Figures 2 and 3, at which it is spaced from the septum to thereby accommodate its sliding adjustment.

The cap 22 is connected to the base 20 by fasteners, e.g., screws 46 or the like, extending through the cap, wall 14a and gaskets 28, 30 into threaded engagement in blind bores 48 in the base. The fasteners 46 are thus isolated by the base 20 and gaskets 28, 30 from gases contained in the sample bag.

Preferably, at least the base 20, gaskets 28, 30, septum 34 and connector 38 are formed from a perfluoroplastic material. Most preferably, that perfluoroplastic material is PTFE, with the gaskets 28, 30 comprising expanded PTFE.

In use, as shown in Figures 2 and 3, the connector 38 is retracted and the septum is slidably adjusted to its open position. The gas to be sampled is delivered via the tubing 44 to the bag interior, after which the septum is slidably adjusted to is closed position as shown in Figure 4, with the connector then having been advanced to frictionally resist any further movement of the septum.

The tubing 44 can then be removed, and the sample bag delivered to a laboratory for analysis of the gas sample. Gas can be removed from the bag via a needle 50 which punctures the septum, as shown in Figure 4.

The sampling bag can be reused repetitively, with each use involving the puncturing of the septum at a different location along its length.

The fitting may be disassembled to replace a worn septum. The connector 38 comprises the most expensive component of the fitting. It can be readily separated for reuse in other fitting assemblies.

In light of the foregoing, it will now be appreciated by those skilled in the art that various changes and modifications may be made to the embodiment herein chosen for purposes of

disclosure, without departing from the spirit and scope of the invention. By way of example only, the tubular connector 38 could be redesigned for snap fit engagement into and out of its advanced and retracted positions. Any convenient and readily available fasteners may be employed in place of the disclosed screws 46.

I claim: